D E L O R A S O F T W A R E ™

by Harmony Systems, Inc.

PacaConnect

Version 1.0

A *virtual Midi interface, merger, patchbay and "proxy server"*

for Symbolic Sound's Paca and Pacarana sound engines

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Table of Contents

Introduction to PacaConnect 1

- The PacaConnect Advantage 1
- The Need for PacaConnect (or PacaMidi) - in Depth 2
- The PacaConnect Way 3
- PacaConnect In Summary 5
- How It Works 5

PacaConnect: Sample Configurations 9

- Set-Up #1: Live/On-Stage with a MacBook or MacBook Pro 9
- Set-Up #2: Simple Studio with any Mac with a built-in Airport 10
- Set-Up #3: Studio with any Mac with a built-in Airport 11
- Set-Up #4: Studio WiFi, any Mac with a built-in Airport 12
- Set-Up #5: Mac Pro Studio, dedicated wireless OSC network 13
- Set-Up #6: Mac Pro Studio, dedicated Paca(rana) network 14

Requirements 15

About Your License 16

Installation 17

Updates or Cross Grade from PacaMidi 18

Set-Up 19

- Run the PacaConnect Preference Pane 19
- Enter Your License Key 20
- Set-up PacaConnect 21
- Run PacaConnect 26

Using PacaConnect 27

Removing PacaConnect 28

Troubleshooting 30

Appendix A: Setting Up An Ad-Hoc WiFi Network 31

Acknowledgements 35

Introduction to PacaConnect

Delora Software's **PacaMidi** offers an economical, convenient way to combine a Symbolic Sound Paca or Pacarana sound engine with one or two MIDI devices. It saves the expense of a Paca(rana) MIDI interface, numerous MIDI cables, and even a hardware MIDI merger. Its use dramatically simplifies a Kyma workstation setup and is especially attractive for portable or performance configurations.

PacaConnect continues with this tradition by adding a significant enhancement: it has a "Pacarana Proxy" that connects a Paca or Pacarana on one network to "clients" connected to a second network. **PacaConnect** does this in such a manner that any application that follows the Pacarana's OSC conventions can have full bidirectional control of the Paca(rana). This includes Delora's **vKi**, **vKi lite**, **vKiP**, and other third party applications like TouchOsc. **PacaConnect** achieves all of this with minimal user configuration and interaction.

PacaConnect also provides the same features as **PacaMidi**, including its "virtual MIDI interface and patchbay". It provides three *merged* MIDI inputs to your Paca(rana), and a MIDI output from your Paca(rana). **PacaConnect** can be used to connect up to two physical MIDI devices like synthesizers or MIDI controllers to the Paca(rana), as well as one or more sequencers or other music software *at the same time*.

The PacaConnect Advantage

The combination of the Pacarana proxy and the "virtual MIDI patchbay" affords new possibilities for reducing overall system complexity, whether on stage or in the studio. For example a viable Kyma performance set up can now be assembled with a Mac Book or Mac Book Pro, a Paca(rana), a FireWire cable, a soundcard, and a simple RG45 network cable. No other external boxes, such as MIDI interfaces, Ethernet routers or switches, or WiFi access points are needed. Furthermore by using a USB keyboard or other controllers, full MIDI performance control over a Kyma sound can be achieved without additional MIDI cables or MIDI components. Full wireless remote control of the Kyma VCS can be achieved by adding an application like **vKi** running on the iPhone/iPod Touch or **vKiP** running on an iPad.

PacaConnect's system streamlining features are not just for live performance. Studio set ups can also benefit by removing unnecessary external devices like MIDI mergers, a

USB MIDI interface connected to the Paca(rana), and potentially WiFi access points and other networking hardware and cables. iMacs, MacMinis, and some Mac Pro models include built-in WiFi connectivity. You can set up special "computer-to-computer" WiFi networks (also called "Adhoc WiFi networks") with these Macs to provide a dedicated Wireless network for interacting with Kyma using OSC. This type of dedicated network affords enhanced reliability as well as reduced control latency, features not only essential for live performance but also of great benefit in the studio. We will show how **PacaConnect** can be beneficially integrated into specific studio or live configurations in the next chapter "*PacaConnect: Sample Set-Ups"*.

The Need for PacaConnect (or PacaMidi) - in Depth

The Paca(rana) does not have a built-in MIDI interface. Without **PacaConnect**, you must attach a USB MIDI interface, control surface, or other MIDI controller directly to the Paca(rana)'s host USB connection, or employ a MIDI interface included as part of the Paca(rana)'s external soundcard. This works well but suffers a few limitations. Let's look at each and see how **PacaConnect** provides an elegant, affordable solution to each.

Limitation #1: Only one device at a time

The Paca(rana) can select only a single USB or FireWire MIDI port at any time. This restricts you to only a single MIDI device without the addition of some type of MIDI merger facility. So a Kyma performance set-up that requires an external MIDI keyboard and a control surface like the MotorMix or BCF2000 would require a hardware MIDI merger device, or a software application running on your computer, to combine the outputs from the keyboard controller and control surface. If your Kyma usage includes some type of sequencing application the challenge becomes even greater to accommodate all the input sources, including MIDI from the sequencer.

Limitation #2: One for the Paca(rana), one for the computer

A very common set up is to have a sequencer or other music program running on a computer and sending MIDI to and from the Paca(rana). This requires that the Paca(rana) have its MIDI interface, and that the computer have a spare MIDI input and output to connect to it. If the computer lacks a MIDI interface, or its existing ones are already in use, then an additional MIDI interface must be added. So in this common use situation you will need to add two USB MIDI interfaces; one for the Paca(rana) and one for the computer.

Limitation #3: Cable cost, clutter, complexity

Establishing a MIDI connection between your computer and the Paca(rana) requires a total of four cables *best case*: two MIDI cables and two USB/FireWire cables. Cables cost money, are potentially untidy, and have a remarkable knack for developing intermittent issues at the wrong time.

This may be understating the problem. Some inexpensive USB MIDI interfaces replace the normal MIDI connector with a built-in cable that plugs directly into the synthesizer or other device. This makes sense until you want to use one of these interfaces for both the computer and Paca(rana). To do this you need a special cable adaptor for each connection. More cost, clutter, and another point of potential failure.

One of the Paca(rana)'s most exciting features is its Open Source Control (OSC) implementation. OSC messages are sent to and from the Paca(rana) over a standard local area network that the Paca(rana) is connected to via its Ethernet connection. This works very well and is nearly configureless because of the Paca(rana)'s various networking features, including Bonjour support.

A common, desirable way to connect the Paca(rana) and control it using a wireless device such as an iPhone or iPad, is to connect the Paca(rana) directly to a computer's Ethernet port and then have the wireless device connect to the computer's built-in WiFi port. This provides a clean, minimal hardware and complexity set up that is ideal for on-stage, or in the studio use. But there is a problem: connecting the devices in this manner creates *two* independent networks that cannot fully communicate with one another. **Without a *bridge* or *proxy* application working with both networks, reliable bidirectional OSC control is not possible**.

The PacaConnect Way

PacaConnect solves the two network communication problem described above by creates a "Pacarana Proxy" so that these two separate networking worlds are united for OSC messages to and from the Paca(rana).

PacaConnect also takes a new approach to the MIDI challenges and limitations described in the previous section that leverages the "MIDI-over-OSC" feature now built into every Paca(rana). MIDI-over-OSC is a standard way to send MIDI between two networked devices using the powerful Open Sound Control (OSC) standard. This means that every device connected to the same network can exchange MIDI information with no additional MIDI interfaces or cables!

The Paca(rana), like your computer, includes a standard network cable connection that can connect to your existing network. This inexpensive cable and **PacaConnect** can now replace all of the MIDI interfaces, mergers, and cables previously mentioned. **PacaConnect** also runs the aforementioned “Pacarana Proxy” so that all network OSC traffic intended for the Paca(rana) (or from the Paca(rana)) arrives as originally intended.

PacaConnect is a small OSX software application, called a "user agent", that silently runs in the background. It always searches for an available Paca or Pacarana on any open networking port. When one is located, **PacaConnect** establishes a "network MIDI connection" with the Paca(rana) using MIDI-over-OSC. **PacaConnect** uses this connection to send and receive MIDI to and from the Paca(rana).

What makes this connection so useful is that **PacaConnect** itself acts like a multi-port MIDI interface with a built-in merging facility. **PacaConnect** provides two device "slots" that can be set to any MIDI device connected to your computer. So if you have an external synthesizer that you like to use as a keyboard controller, and a VCS-compatible control surface device like a MotorMix or BCF2000, **PacaConnect** *merges* their MIDI data and sends it on to the Paca(rana), just as if you had a physical two port MIDI interface with merging connected to the Paca(rana). Likewise when the Paca(rana) sends MIDI it is routed to both external devices.

PacaConnect also starts the “Pacarana Proxy” and uses Bonjour to advertise Pacarana OSC services with the name <PACARANA_NAME>*, where the item in the brackets is replaced by the actual Paca(rana) name. For example if **PacaConnect** finds a Paca(rana) named "beslime-333" it will advertise the name "beslime-333*" as an available Paca(rana) using Bonjour. Applications like **vKiP** running on an iPad connected wirelessly to the Mac, but on a different network than the Paca(rana), will see the proxy as just another Paca(rana). Once the device connects to the proxy it can send and receive Pacarana OSC message as if it were directly connected to the Paca(rana).

PacaConnect does even more. It creates an OSX "virtual MIDI port" that any application can use to send and receive MIDI to and from the Paca(rana). This virtual MIDI port is available simultaneously to any interested application. So if you have one (or more) music applications you need to use at the same time to send MIDI to the Paca(rana), **PacaConnect** handles it for you.

PacaConnect is built for ease of set up and use. In fact after you take a few minutes to install and adjust a few settings **PacaConnect** can do its work automatically for you without further attention. You can even set it to run every time you log into your Mac.

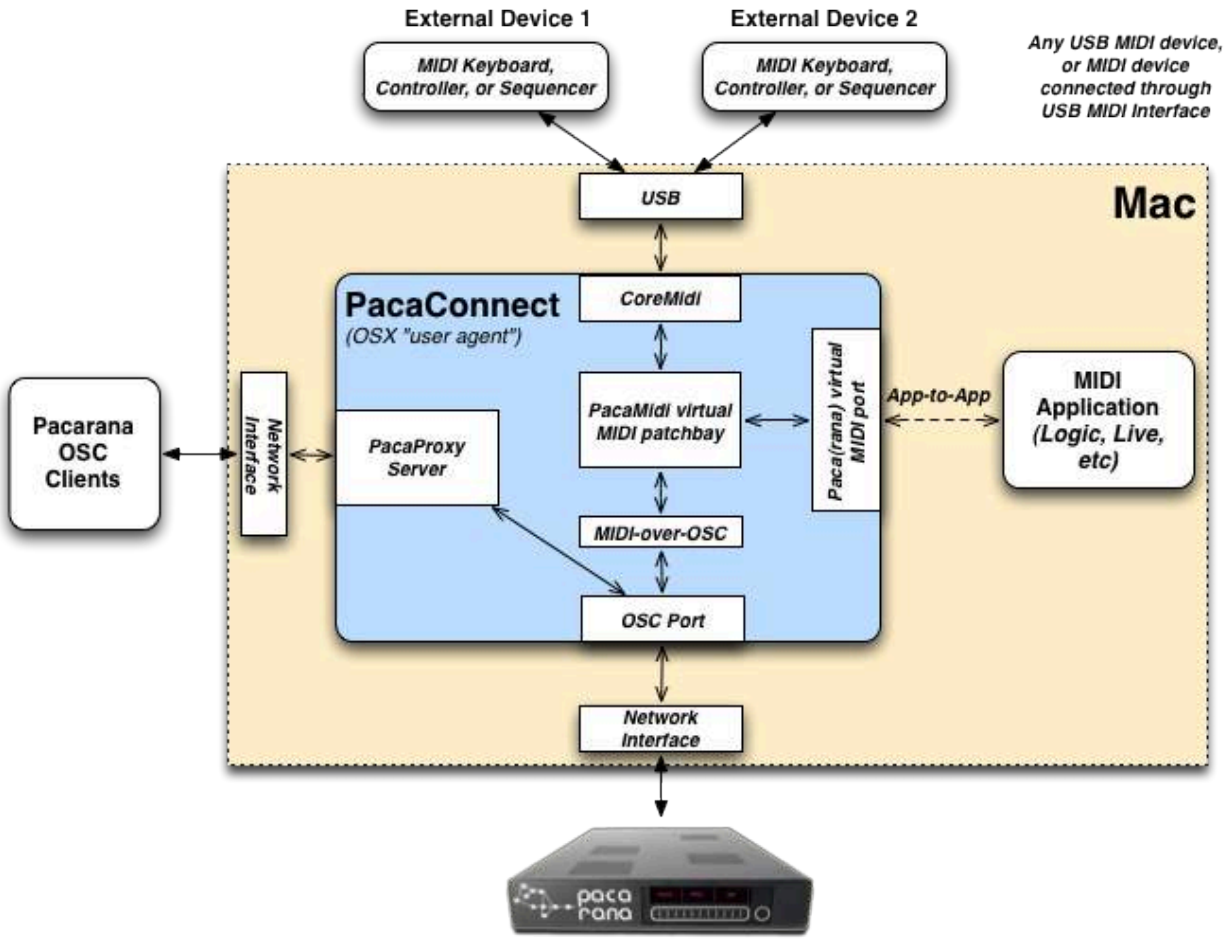
PacaConnect In Summary

- Native OSX user agent program that is compatible with Intel and G5 Macs running Leopard.
- Provides full bidirectional OSC control of Paca or Pacarana running on a different network than the OSC control client.
- Dramatically reduces on-stage Mac Book or Mac Book Pro setup complexity by eliminating the need to have some type of WiFi router/switch/hub, as well as various MIDI paraphernalia.
- Makes it straight forward (without extra components with any Airport enabled Mac) to establish an optimal dedicated wireless OSC control network with improved robustness and reduced latency.
- Adds up to two always available MIDI control inputs and outputs to the Paca(rana), plus a "virtual MIDI port" for software applications.
- Saves the expense of a USB MIDI interface, MIDI cables, and reduces network hardware requirements.
- Compatible with wireless OSC applications running on the iPhone, iPod Touch, and iPad like vKi, vKiP, and TouchOsc.
- MIDI connectivity fully supports external MotorMix or BCF2000 VCS controllers, as well as other MIDI "knob boxes" that can be used with the VCS's "MIDI Learn" feature.
- "Set up once and forget about it" ease-of-use.

How It Works

This diagram on the next page illustrates what **PacaConnect** provides, and how it interacts with your MIDI devices, applications, and Paca(rana).

PacaConnect



PacaConnect is a "native" OSX application that works silently in the background. Technically it is a "user agent" program, a special type of OSX application that is ideally suited for this kind of task. User agents like **PacaConnect** do not require (nor offer) any direct user interface. Their operation is fully under OSX's direction. **PacaConnect** can automatically start when you log into your OSX account. If OSX detects any type of problem it can automatically restart **PacaConnect**. If you need to manually control **PacaConnect**'s operation, or adjust its few settings, it has a control panel available through OSX's System Preferences, just like you control your mouse, keyboard, and other OSX components. All of this makes **PacaConnect** seem more like a Paca(rana) add-on and less a piece of software you run on your computer.

A brief comment about **PacaConnect** being "native" - **PacaConnect** was created using OSX's standard developer tools and languages. It does not require a special "run time"

or other unique components for it to operate. This insures smoother operation, less processing and memory demands, and better overall compatibility with OSX. Since **PacaConnect** was created with the same tools Apple uses for its applications you can expect a smoother transition when OSX, or your Mac, changes in the future.

PacaConnect uses Symbolic Sound's "MIDI over OSC" feature supported in Paca(rana) based Kyma setups. This lets **PacaConnect** replace two MIDI interfaces and at least two MIDI cables with a single network cable that you may already be using! This saves the expense of as many as two MIDI interfaces, as well as the cables.

The **PacaConnect** user agent has five major sections:

1. PacaProxy Server that connects a Paca or Pacarana on one network to "clients" connected to a second network.
2. CoreMidi-based interface to connect up to two external MIDI devices.
3. CoreMidi-based virtual MIDI port used by sequencers and other applications.
4. "MIDI-over-OSC" component to handle MIDI communications with the Paca(rana).
5. "Virtual MIDI patchbay" that connects all of the MIDI devices and ports with the Paca(rana).

The MIDI patchbay is in some ways the heart of **PacaConnect** (& **PacaMidi**). It receives MIDI from the external devices, and any application, and *merges* those MIDI streams together in such a way that every device's MIDI activity reliably reaches the Paca(rana). So, for example, your external keyboard and your sequencer could both play the same sound at the same time. Another typical use is to have a VCS control surface like the MotorMix and your keyboard both controlling a Kyma sound. If you tried to do this with a hardware-only MIDI scheme you would not only need the required MIDI interfaces but in the case of having both a keyboard and MotorMix operating you would need the MIDI interface to have two ports and provide MIDI merging. This is normally accomplished with a USB interface on the Paca(rana) and an extra hardware device called a "MIDI merger".

The patchbay also delivers MIDI from the Paca(rana) to any connected device or application.

Note in the diagram that there are two network interfaces shown provided by the Mac. The one on the left is used for connections to various potential Pacarana OSC clients. The second network interface at the bottom is shown connected to the Paca(rana). PacaConnect's "PacaProxy Server" handles all of the various details that make it possible

for a client on the first network to connect with the Paca(rana) with full bidirectional OSC control. *(Note: This PacaProxy Server is the key component that differentiates PacaConnect from PacaMidi).*

One aspect of the Paca(rana) that needs to be heeded is that it only provides a single MIDI input and output. Thus all of your devices and applications share the same up to sixteen MIDI channels in both directions. All Kyma sounds share these same sixteen channels.

The implication is that your sequencer, and external devices, can at most have sixteen independent MIDI "tracks" at one time. So if you choose to use two different applications at once keep in mind that you only have sixteen channels to work with.

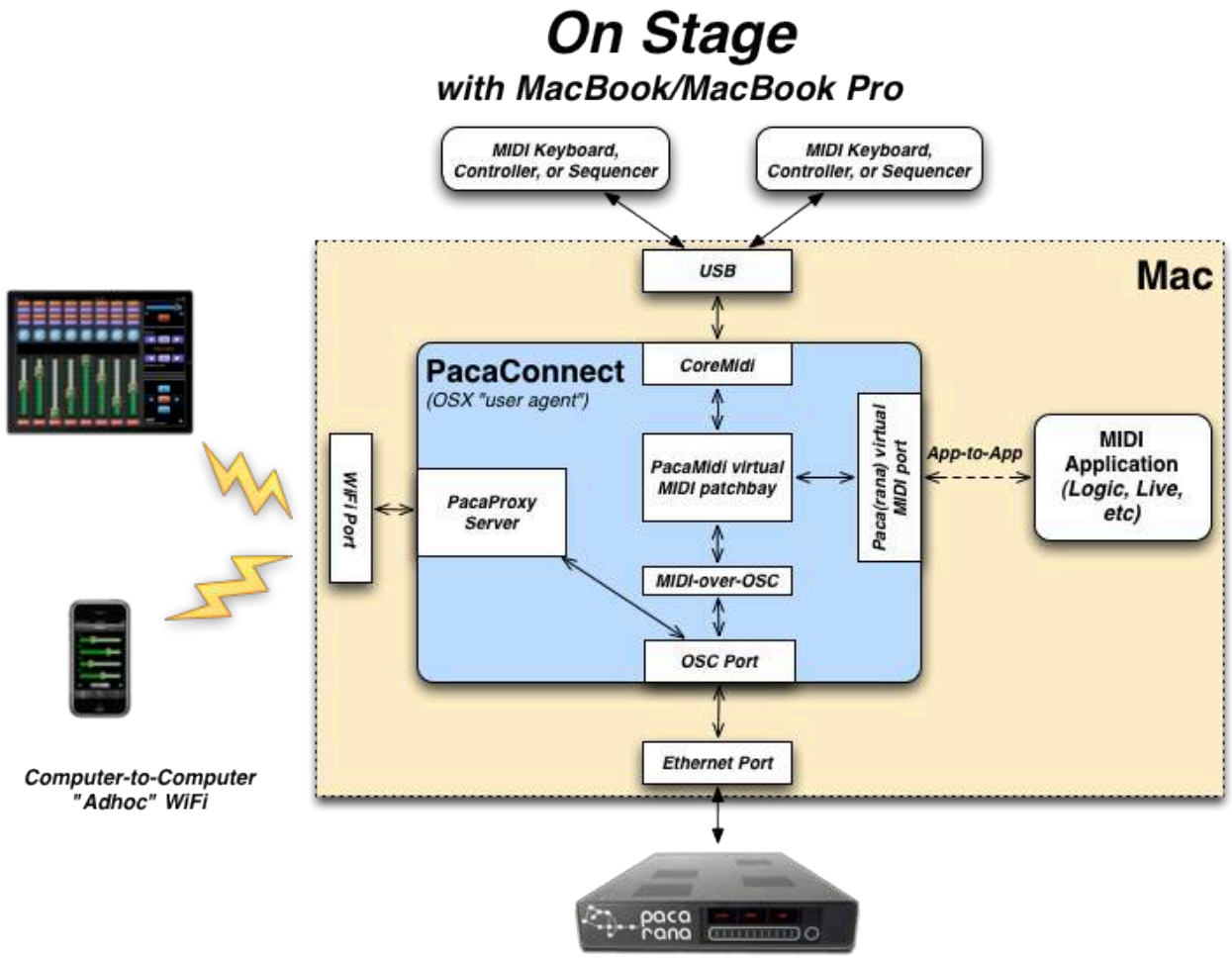
One final note regards Kyma VCS control surface support. Kyma currently uses MIDI channel 1 for all VCS control surface communications when Kyma is set up in “MotorMix” mode. MIDI Control Change numbers (CCs) sent on channel 1 are reserved for VCS use and will not reach a Kyma sound, nor be made available for such things as the VCS’s “MIDI Learn” feature. If you plan to send or receive these types of MIDI messages to your Kyma sounds, or use VCS “MIDI Learn” you need to set your controller to send on a channel other than 1.

PacaConnect: Sample Configurations

In the previous chapter, we touched on the role of **PacaConnect** in several setup scenarios. Here we will show the power of **PacaConnect** by integrating it into a variety of studio oriented or live configurations.

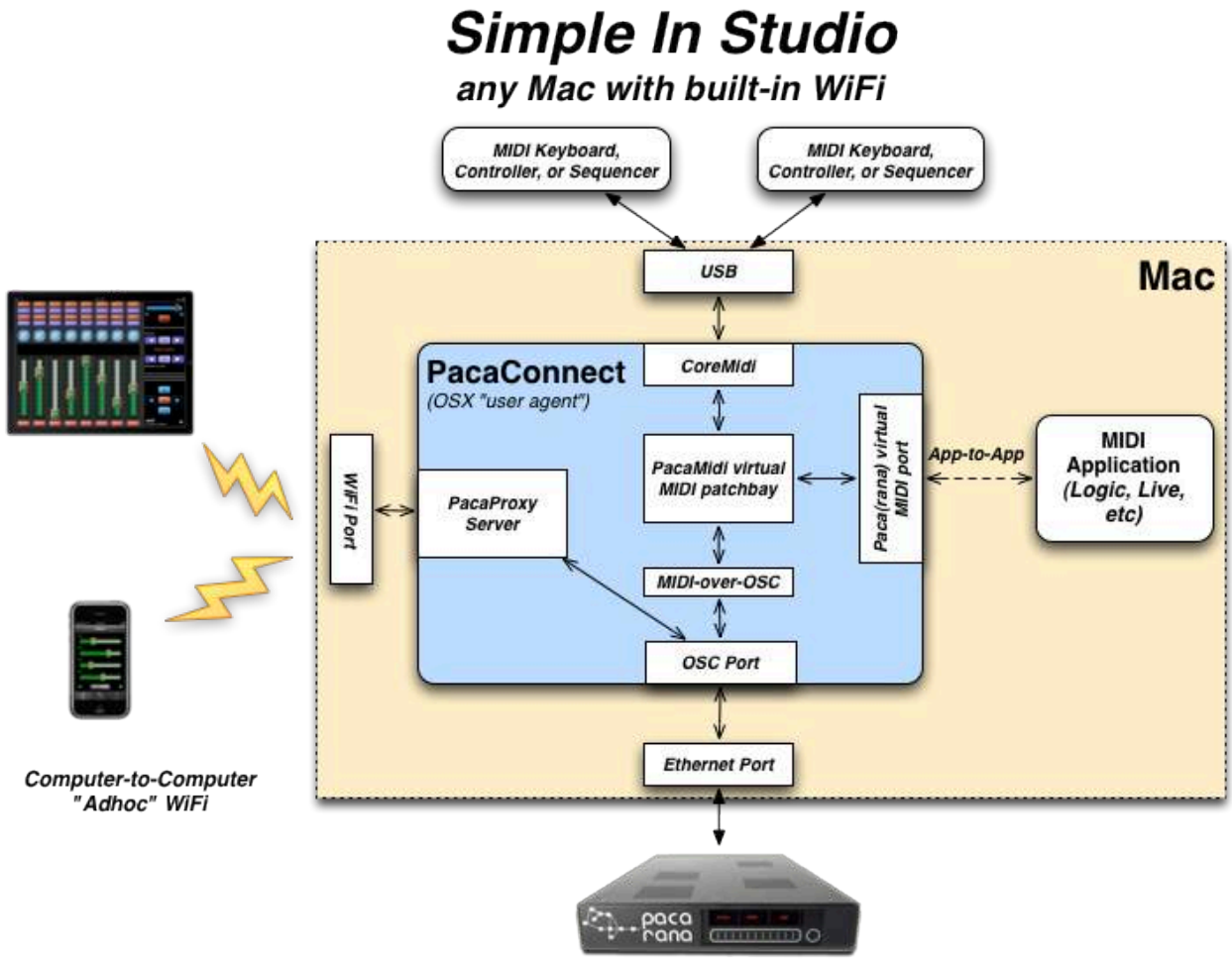
If you need advice on how to set up an "adhoc" WiFi network that is assumed in some of the following configurations, go to Appendix A: Setting Up an Ad-Hoc WiFi Network.

Set-Up #1: Live/On-Stage with a MacBook or MacBook Pro



This is a typical stage set up built around a Mac laptop. The laptop's built-in Ethernet port connects directly to the Paca(rana) with a simple RG45 networking cable (for simplicity the FireWire connection between the laptop, Paca(rana), and soundcard is omitted from the diagram). The Mac's Airport is set up via OSX's Networking Preference Pane to provide a "computer-to-computer" wireless network. iPhones, iPod touches, and iPads (as well as other WiFi devices) can connect to this network. Once connected they will "see" the Paca(rana) advertised using Bonjour by the PacaProxy Server. Once connected to the proxy the devices can send and receive OSC messages from the Paca(rana) just as if they were directly connected. Since the WiFi network is dedicated for the OSC clients the connections have improved robustness and reduced latency.

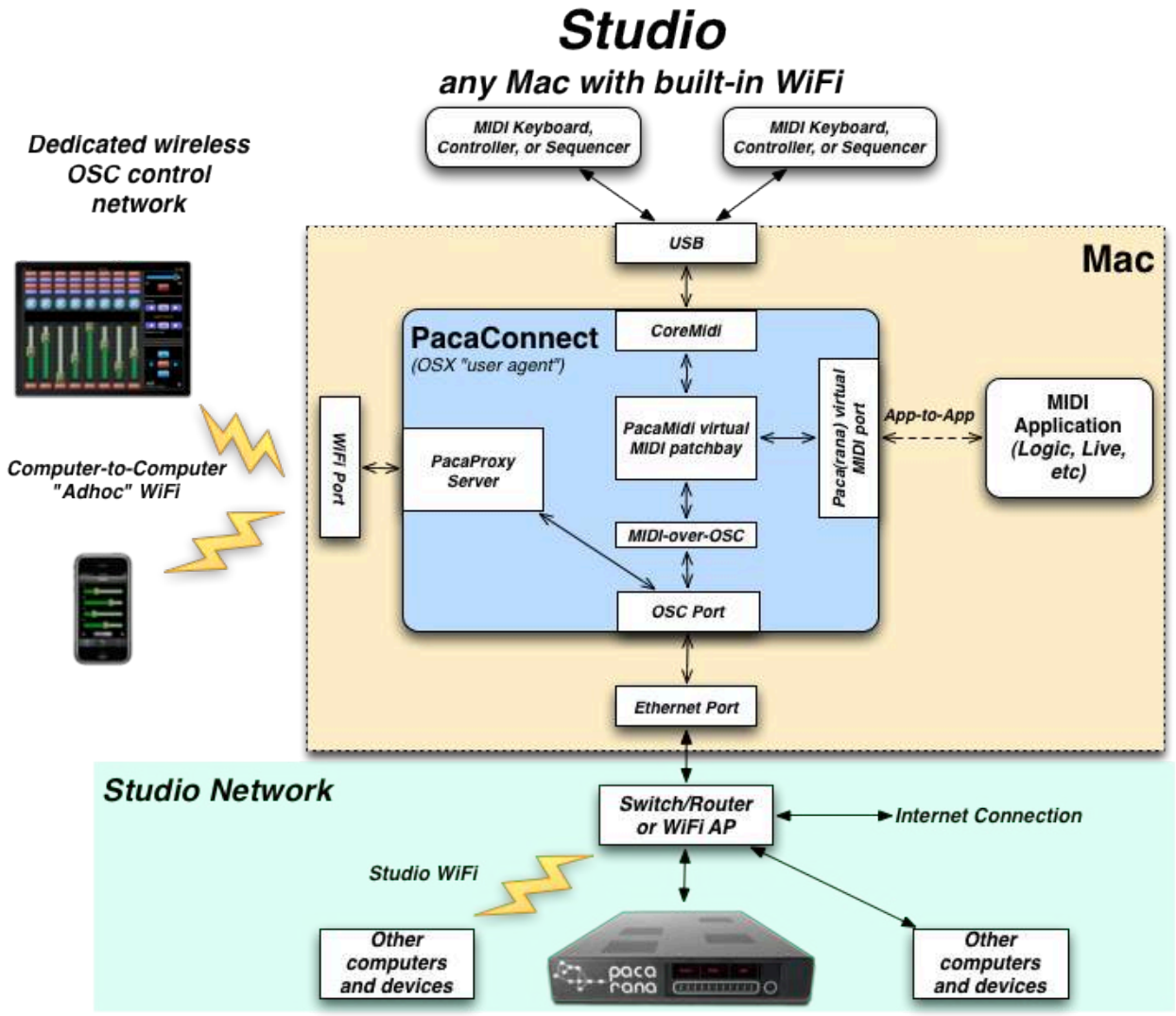
Set-Up #2: Simple Studio with any Mac with a built-in Airport



This second example show the same "minimal" set up as the previous example applied to a studio setting. Operationally it behaves the same as the previous example. iMacs,

MacMinis, and many Mac Pros can be used with this type of set up. Mac Books or Mac Book Pros of course also work well in this set up.

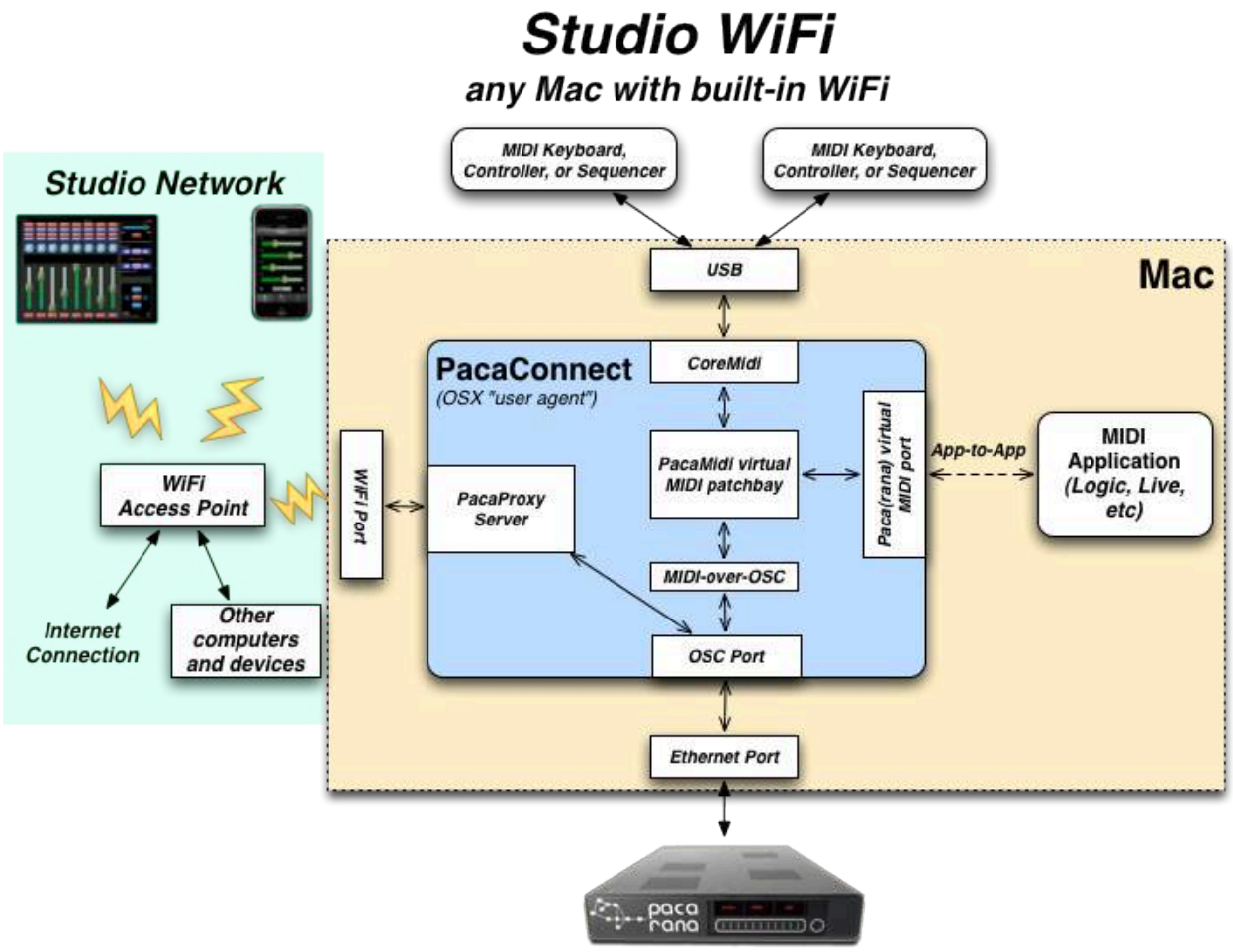
Set-Up #3: Studio with any Mac with a built-in Airport



A more complete studio setup would probably have a full network, including Internet connectivity, that the studio computer participates in. This network may even include a WiFi connection. One way to connect the Paca(rana) would be to place it on the overall network so that it can be reached by other devices. This was the common way to connect the Paca(rana) prior to **PacaConnect**. One disadvantage of this approach occurs when you connect an OSC client device (for instance **vKiP** or TouchOsc running on an iPad) to the studio network's WiFi. This may or may not suffer from control data loss or

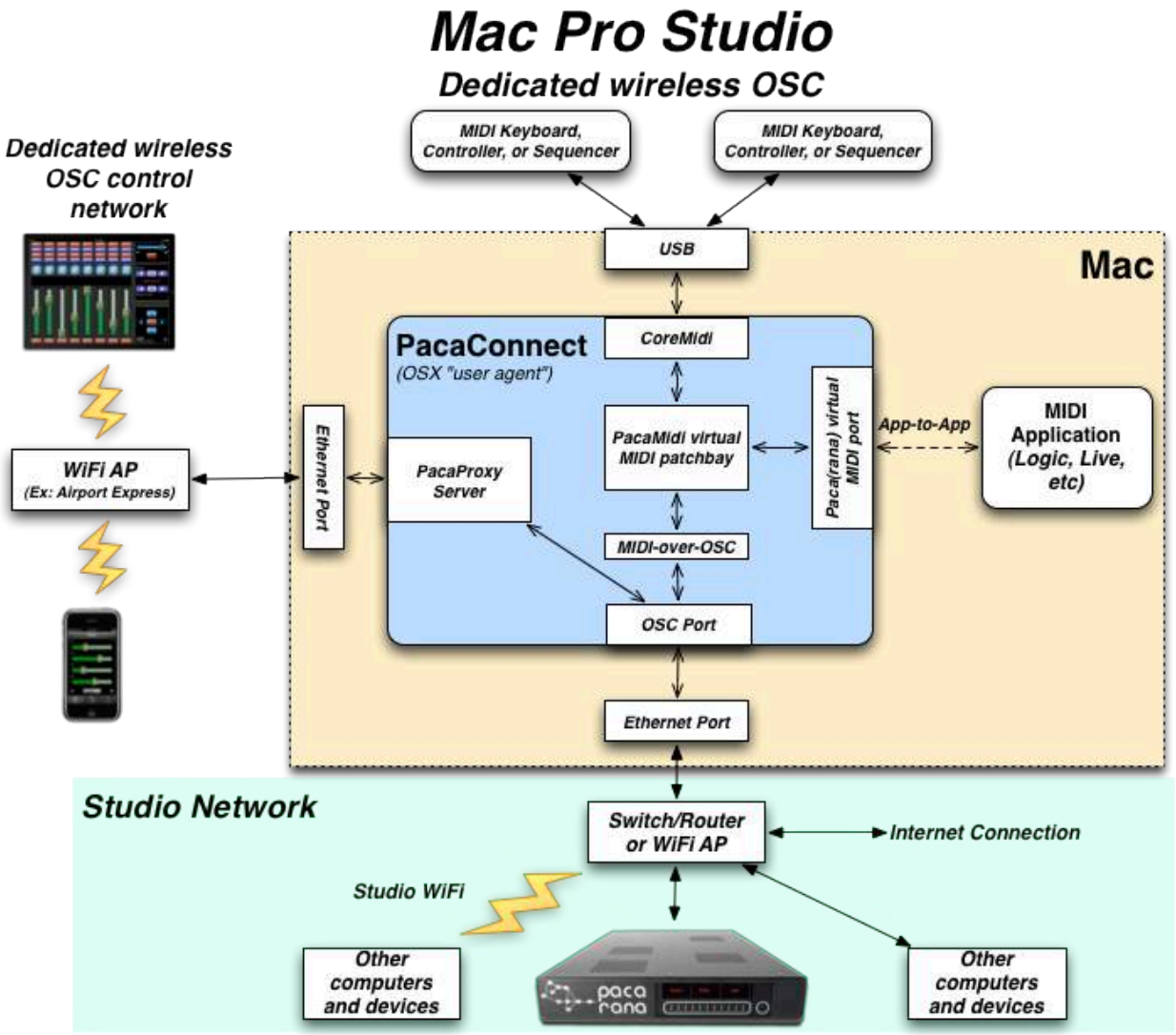
control latency depending on the overall network activity over the WiFi portion. If instead a private OSC control wireless network is established using the computer's WiFi OSC control, integrity and latency should improve. PacaConnect's PacaProxy Server makes this possible.

Set-Up #4: Studio WiFi, any Mac with a built-in Airport



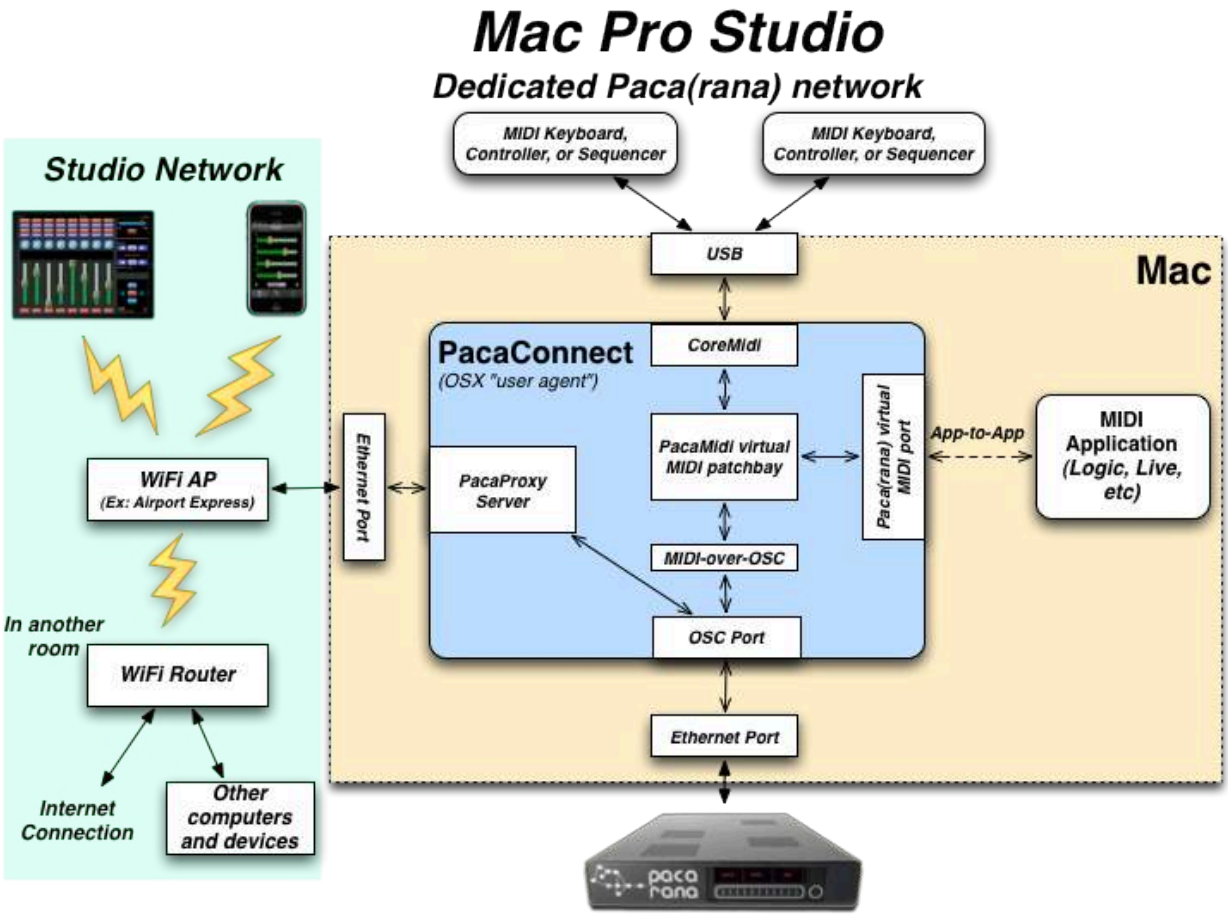
One common way to connect a studio computer to an overall home or office network is using its built-in WiFi port. If the WiFi access point/router is physically removed from the studio this creates a challenge for also connecting the Paca(rana)'s OSC networking. PacaConnect's PacaProxy Server is the "missing link" that affords a very simple, low-cost solution: use the Mac's Ethernet port. This approach saves the cost of some type of WiFi router adjacent to the Paca(rana) or a USB WiFi "dongle" for the Paca(rana).

Set-Up #5: Mac Pro Studio, dedicated wireless OSC network



Mac Pro based studios when the Mac has a built-in Airport can use any of the previous set ups. But what's the best approach when the Mac Pro does not have WiFi? The approach shown above places the Paca(rana) on the overall studio network and uses the Mac Pro's second Ethernet port to establish a dedicated WiFi network. This configuration affords the most robust and responsive OSC control.

Set-Up #6: Mac Pro Studio, dedicated Paca(rana) network



Sometimes the WiFi router and/or switch is physically distant from the Mac Pro and you have to use WiFi to connect to the overall network (including Internet). A simple WiFi access point, like the Airport Express, will not normally work as it does not support multiple Ethernet connections (it does not have a switch or "hub" feature). **PacaConnect** provides a work-around as you can place the Paca(rana) on a second Mac Pro Ethernet port and connect the other to the overall network using the simpler Airport Express (or equivalent).

Requirements

- Intel or G5 Mac running OSX 10.5 (Leopard) only.
- Symbolic Sound Paca or Pacarana sound computation engine running Kyma software and firmware version 6.81 or higher.
- A network connection between your Mac and Paca(rana); PacaProxy requires Airport or other additional network interface

About Your License

PacaConnect requires a license that is contained within a special file. You received this license when you purchased **PacaConnect**, or when you requested the **PacaConnect** demo. Your license file is unique *to you*. It contains your name and contact information. Please take proper measures to insure that it remains safe and secure.

If you are evaluating **PacaConnect** the demo license that we sent you is valid for a limited time. The time interval should be sufficient for you to do a proper evaluation and hopefully see how invaluable **PacaConnect** is in your daily workflow. However, if you need additional time please contact sales (sales@delora.com) to discuss your specific requirements.

Entering your license is the second step of the Setup process (see Chapter "Set-Up"). Once the license is installed, **PacaConnect** will work on that computer, even if you later add more memory, add or replace hard drives, or reinstall OSX, provided the license file is not deleted. Should your license file ever become damaged or inadvertently removed you will be greeted by a message on the PacaConnect preference pane like the one that occurred when you first installed the program. Repeat the same steps you used before to reinstall your license, or replace it with a new one. If you continue to encounter difficulties, or you have misplaced your license file, *please email product support (support@delora.com) and we will help you work through the issue.*

Installation

Note: If you are updating your already installed PacaMidi application with the cross-grade PacaConnect application, or updating a previous installation of PacaConnect please go to the next chapter "Updates or Cross-Grade From PacaMidi" for the installation procedure.

PacaConnect uses OSX's standard installation application to place its required files in the appropriate locations on your Mac's hard drive.

The entire **PacaConnect** application is contained in the single installation file, **PacaConnect**, provided on the distribution media. To install **PacaConnect**, simply double-click on this file. The OSX installer will then walk you through the installation.

PacaConnect consists of two program components, its "preference pane" and the "user agent". You interact, as needed, with **PacaConnect** through its preference pane. The user agent component works silently in the background and is managed by OSX directly. The preference pane settings inform OSX and the agent how you wish it to operate.

If you have set your Mac up with only a single OSX user account then **PacaConnect** works pretty much as you would expect. Each time you log-in to your account (or if you have automatic log-in turned on) OSX starts **PacaConnect** up and it is ready to go. When you log out of your account **PacaConnect** is halted.

If, on the other hand, you share your Mac with other users who each have their own account then there are a few things to consider. **PacaConnect** is installed as a system wide resource, meaning that each user account can potentially use **PacaConnect**. **PacaConnect** is designed to work seamlessly in this situation. For example your license, once installed, validates all possible user accounts. Each account can also have its own settings for **PacaConnect**.

PacaConnect only runs in an account in which it has been set up to operate. This includes the account you were in when **PacaConnect** was installed! To turn **PacaConnect** "on" you must visit its preference pane in System Preferences at least once to enable **PacaConnect** to operate in that account. So each user account will have to do so in order for **PacaConnect** to operate when that account is active. Conversely if you do not want **PacaConnect** to run when an account is active simply do not ever "turn it on" or use the preference pane to disable it.

Updates or Cross Grade from PacaMidi

If you are updating **PacaConnect**, or *cross-grading from **PacaMidi,*** please follow these procedures:

- Run System Preferences and click on the PacaConnect (or PacaMidi for a cross-grade) preference pane
- Press the STOP button
- Quit/close System Preferences
- Click on the PacaConnect installer file sent to you and follow the installation instructions
- Run System Preferences and click on the PacaConnect preference pane. Verify all your settings and the press RUN to start **PacaConnect**.

If you are cross-grading you should also uninstall **PacaMidi**. Please see its user manual for further instructions.

Set-Up

Once you have finished installing **PacaConnect** you will need to follow these steps to begin using it:

1. Run System Preferences and select the PacaConnect preference pane.
2. Enter your license key (you only need to do this once).
3. Set up **PacaConnect** to select which two (if any) external MIDI devices to connect directly to the Paca(rana).
4. Run **PacaConnect**.

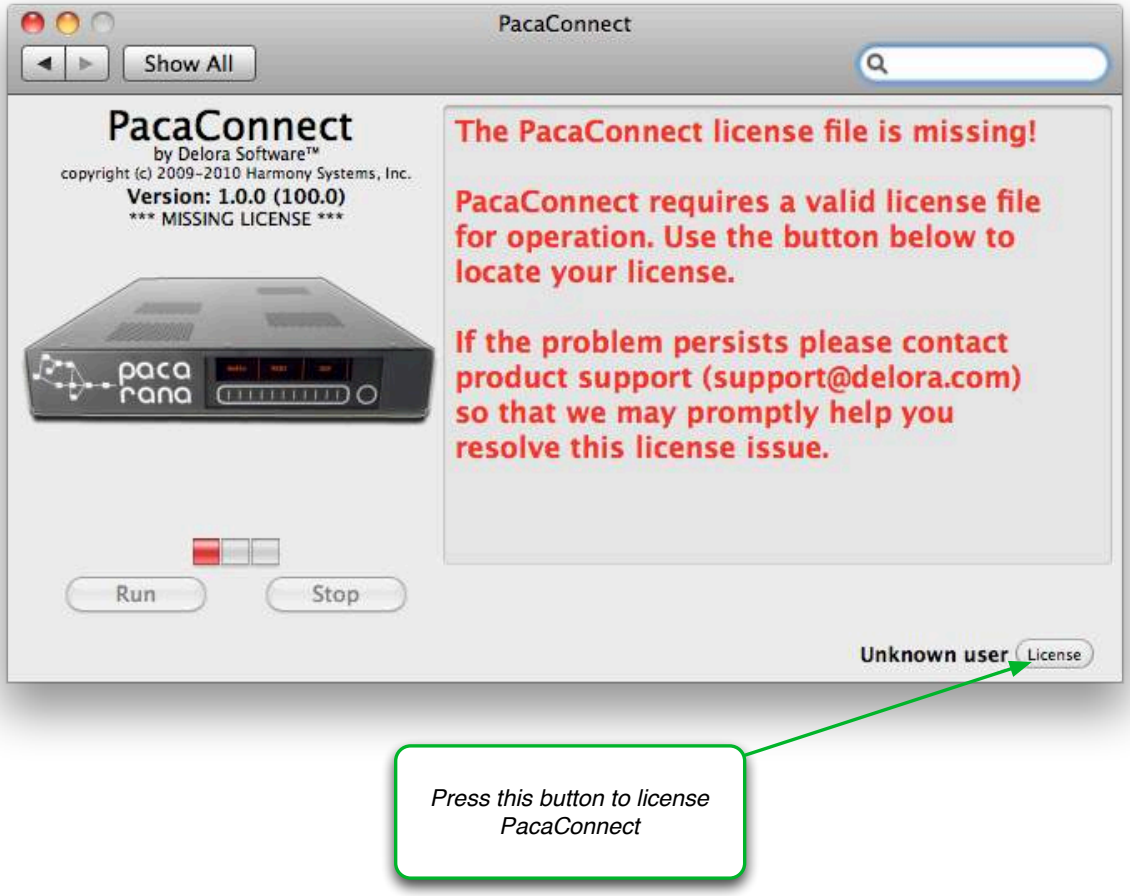
Run the PacaConnect Preference Pane

*Note: You must run the PacaConnect preference pane at least once, otherwise **PacaConnect** will not run! Also you must access the preference pane the very first time from an account that has administrator privileges.* **PacaConnect** will not allow you to enter your license unless you have administrator privileges. Once this has been done you can access the preference pane from any account.

Select *System Preferences...* from the "Apple Menu" (upper left corner of screen). Click on the **PacaConnect** icon (highlighted in the screen shot above).

Enter Your License Key

The first time you select the PacaConnect preference pane from the System Preferences application you will encounter a message like the one in red text in the graphic. Press the *License* button and use the file dialog to locate the license file you received as part of your order or demo request. (You will also see this message if you are a demo or beta user and your demo/beta license has expired).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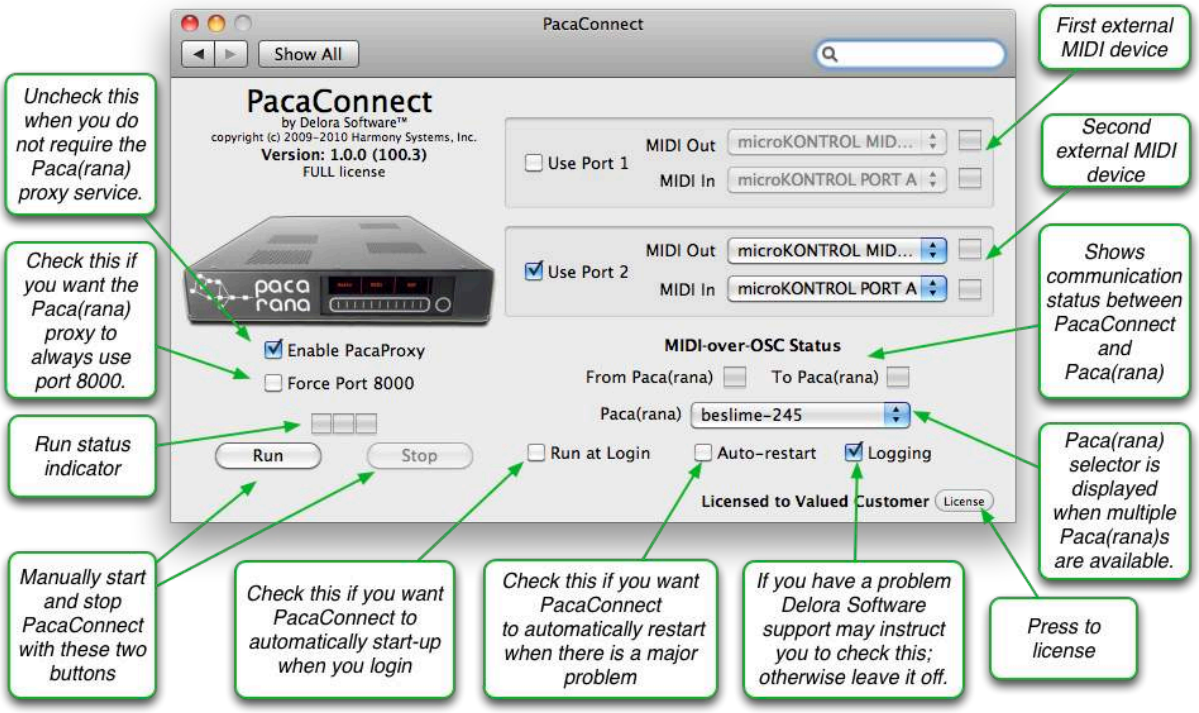
Version: 1.0.0 (100.0)
*** MISSING LICENSE ***
The PacaConnect license file is missing!
PacaConnect requires a valid license file for operation. Use the button below to locate your license.
If the problem persists please contact product support (support@delora.com) so that we may promptly help you resolve this license issue.
Run
Stop
Unknown user
License
Press this button to license PacaConnect

If you are installing your first production version of **PacaConnect** but have a Beta or demo license installed that is still valid, the "PacaConnect license file is missing" message will not display on the preference pane screen. Instead, you will see the message in the bottom right corner - "licensed to demo user" or "licensed to beta user". Press the *License* button and use the file dialog to locate the production version license file you received as part of your **PacaConnect** purchase.

Once you have entered your license file **PacaConnect** will use the contained information to fully license your copy. The license file itself is no longer required for **PacaConnect** to operate. *Please back it up and then remove it if you wish.*

Set-up PacaConnect

This step is where you inform **PacaConnect** about your MIDI setup and how it should be used. You can also manually run and stop **PacaConnect** from the preference pane if you prefer to manage its operation directly. **PacaConnect** works whether the preference pane is open or not. When it is open it provides visual indication of whether **PacaConnect** is running, if it is connected to the Paca(rana) and any assigned MIDI devices, and shows any MIDI activity. This is handy when investigating any problems you might encounter.


PacaConnect
Show All
PacaConnect
by Delora Software™
copyright (c) 2009-2010 Harmony Systems, Inc.
Version: 1.0.0 (100.3)
FULL license
Use Port 1
MIDI Out
microKONTROL MID...
MIDI In
microKONTROL PORT A
Use Port 2
MIDI Out
microKONTROL MID...
MIDI In
microKONTROL PORT A
paca rana
Enable PacaProxy
Force Port 8000
MIDI-over-OSC Status
From Paca(rana)
To Paca(rana)
Paca(rana)
beslime-245
Run
Stop
Run at Login
Auto-restart
Logging
Licensed to Valued Customer
License
Uncheck this when you do not require the Paca(rana) proxy service.
Check this if you want the Paca(rana) proxy to always use port 8000.
Run status indicator
Manually start and stop PacaConnect with these two buttons
Check this if you want PacaConnect to automatically start-up when you login
Check this if you want PacaConnect to automatically restart when there is a major problem
If you have a problem Delora Software support may instruct you to check this; otherwise leave it off.
Press to license
Paca(rana) selector is displayed when multiple Paca(rana)s are available.
Shows communication status between PacaConnect and Paca(rana)
Second external MIDI device
First external MIDI device

PacaConnect offers up to two "slots" that can be used to connect external MIDI devices directly to the Paca(rana). This is handy if you always use a keyboard or other controller to play Kyma sounds. It is also useful if you have a VCS compatible hardware control surface like a MotorMix or BCF2000. You can assign the control surface to one slot and it will always be available to Kyma. The hardware slots are also useful if you like to use a hardware sequencer.

PacaConnect uses OSX's CoreMidi facility so it works with physical *or virtual* MIDI devices that have proper CoreMidi drivers. Many controllers today use USB to connect to the computer and provide a CoreMidi driver so that applications can connect to the device. Some synthesizers also provide this type of USB-MIDI connection. These synthesizers do not require an extra MIDI interface. But if you are using a "plain old MIDI"

synthesizer or controller then you will of course need some type of OSX compatible MIDI interface to connect it to your Mac.

Each slot has a "MIDI In" and "MIDI Out" selector. You can assign any device to these. Normally this will be an input and output from the same MIDI device but it need not be. So, for example if you have a MIDI keyboard and a sound module you wish to use with Kyma you could use one slot for both; select the keyboard as the "Midi In" device and the sound module as the "Midi Out" device.

Each slot can be turned on and off with the corresponding checkbox. If you do not wish to use a slot then it is best to leave it disabled. Otherwise whatever device is selected will send MIDI to (or receive MIDI from) the Paca(rana). On the other hand do not worry about leaving a device you infrequently use always connected. Finally, the enable check boxes can be used to temporarily disable a slot should you need to do so for any reason. Your current device selections are retained.

The Paca(rana) requires no set up. **PacaConnect** locates the Paca(rana) and establishes the connection automatically, provided the Paca(rana) is properly running and connected to the same network as your computer. The square "LED" indicators next to "From Paca(rana)" and "To Paca(rana)" provide a visual indication of this connection. We'll discuss the status indicators in a moment.

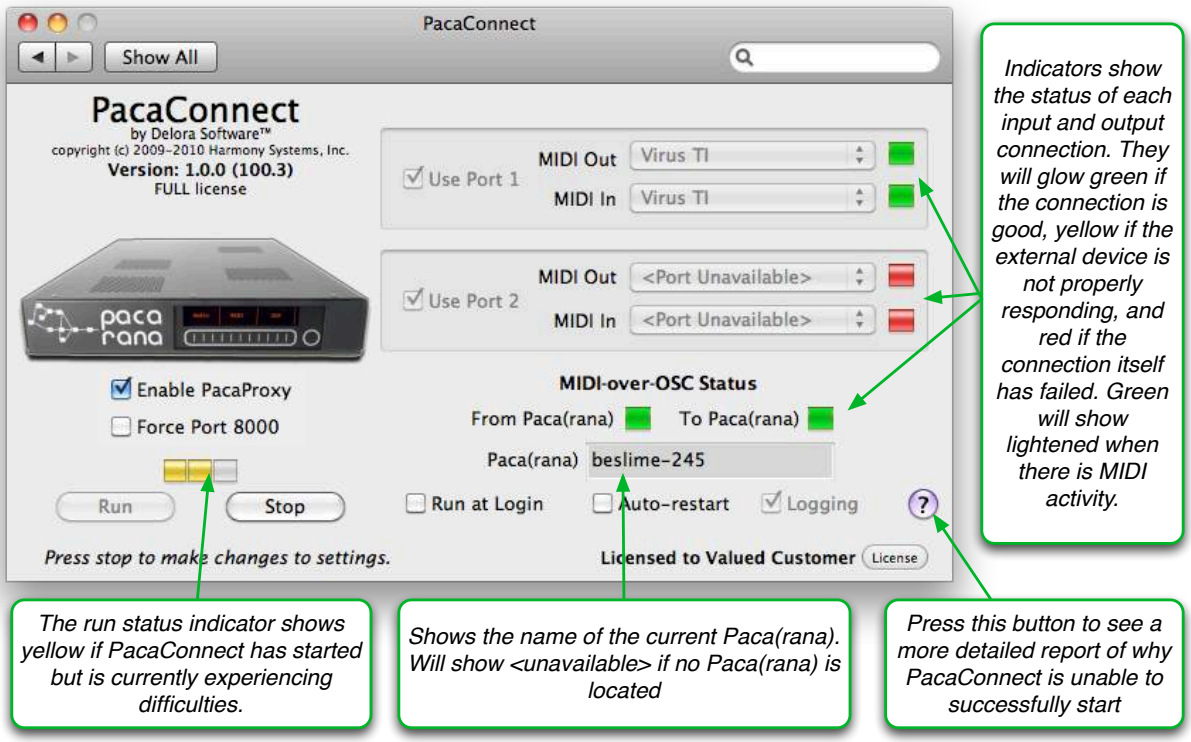
The “PacaProxy” is also automatically configured. It always runs whenever **PacaConnect** has connected to a Paca(rana) *unless you disable it by unchecking the **Enable PacaProxy** checkbox*. You might do this if you wish to only use **PacaConnect’s** MIDI facilities. Additionally the checkbox *Force Port 8000* is used to make PacaConnect always assign port 8000 to the PacaProxy. When uncheck the port is automatically chosen, and is consistent from run to run unless there is a conflict. If you wish to guarantee the same port, or you need to maintain compatibility with the Paca(rana)’s port (which is 8000), check this box.

Two additional checkboxes are used to set the automatic aspects of **PacaConnect**. *Run at Login* is checked if you want **PacaConnect** to run every time you log into your account. **PacaConnect** places very little burden on your Mac so we believe it is best to let it run all the time so you do not have to remember to run it every time you wish to use it. However if you prefer manual operation simply uncheck the box and visit the preference pane whenever you need to run or stop **PacaConnect**.

The *Auto-restart* checkbox turns on **PacaConnect**'s automatic recovery system. Should **PacaConnect** ever crash or in some way become "stuck" OSX will detect it and attempt to restart it. Most users should leave this checked, even if they prefer manual opera-

tion. Uncheck this only if you are experiencing repeated, frequent crashes and then contact support@delora.com for assistance.

The final checkbox, *Logging*, is used to turn on special reporting features. Normally this is unchecked unless you have been instructed by Delora Products Support to turn it on.


PacaConnect
Show All
PacaConnect
by Delora Software™
copyright (c) 2009-2010 Harmony Systems, Inc.
Version: 1.0.0 (100.3)
FULL license
Use Port 1
MIDI Out
Virus TI
MIDI In
Virus TI
Use Port 2
MIDI Out
<Port Unavailable>
MIDI In
<Port Unavailable>
Enable PacaProxy
Force Port 8000
MIDI-over-OSC Status
From Paca(rana)
To Paca(rana)
Paca(rana) beslime-245
Run
Stop
Run at Login
Auto-restart
Logging
Press stop to make changes to settings.
Licensed to Valued Customer
License
Indicators show the status of each input and output connection. They will glow green if the connection is good, yellow if the external device is not properly responding, and red if the connection itself has failed. Green will show lightened when there is MIDI activity.
The run status indicator shows yellow if PacaConnect has started but is currently experiencing difficulties.
Shows the name of the current Paca(rana). Will show <unavailable> if no Paca(rana) is located
Press this button to see a more detailed report of why PacaConnect is unable to successfully start

The *Run* and *Stop* buttons provide manual control of **PacaConnect** and are self explanatory. Above those is the run status indicator. It displays whether PacaConnect is currently running, and if it has encountered problems. These buttons and the indicator are discussed in detail in the *Run PacaConnect* section that follows.

Each assigned MIDI device has an indicator for its input and output. These indicators are color-coded to display the status of each input and output. This is what each color means:

- "Clear" - the device is essentially off, meaning that it is either disabled (unchecked), or **PacaConnect** is not currently running.
- "Red" - the device is experiencing a problem. Usually this means that the port is no longer available to CoreMidi. This can happen, for example, if you have turned

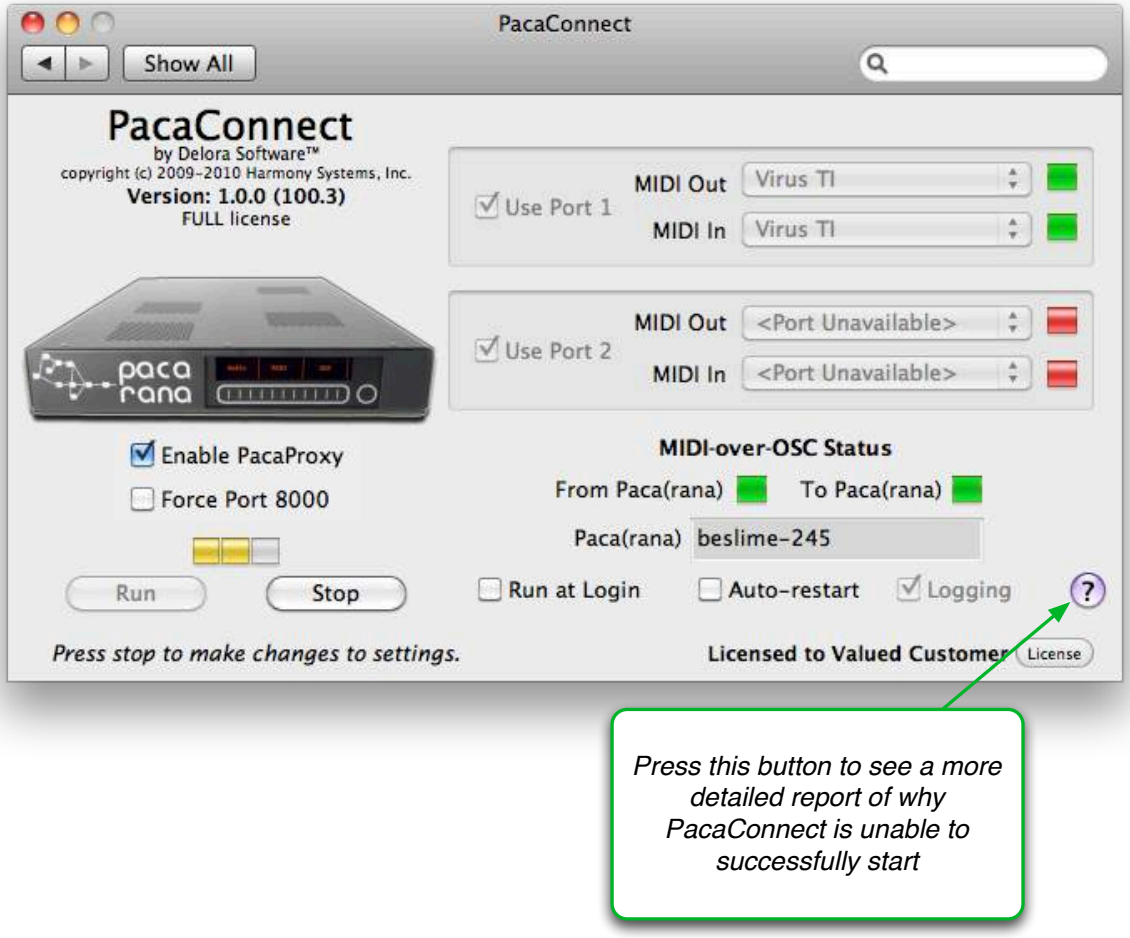
off or disconnected a USB MIDI device. If you power the device, or reconnect it, **PacaConnect** adjusts and the device will be back in use.

- "Dark Green" - the device is operating properly but is not showing any current MIDI activity.
- "Light Green" - the device is showing current MIDi activity. **PacaConnect** keeps track of all of the MIDI traffic and will show this color when there has been activity on that device within the last few seconds. So if you play a note on your controller it should glow immediately but will take a bit to return to "dark green".

The MIDI-over-OSC section has similar status indicators:

- "Clear" - **PacaConnect** is not currently running.
- "Red" - **PacaConnect** is unable to connect with the Paca(rana). Normally only the "To Paca(rana)" indicator will show this status. When it happens it is almost always due to the Paca(rana) not being powered or is unconnected from the network. If the "From Paca(rana)" indicator is red then **PacaConnect** has experienced an error with its own network support. This likely means there is a problem with **PacaConnect** that requires a manual restart.
- "Yellow" - **PacaConnect** and Paca(rana) exchange various messages from time to time to maintain a healthy connection. When the indicator is yellow it means that this exchange is not happening. The most likely reason this occurs is that the Paca(rana) has just recently disconnected from the network, or just been turned off. Note that when the "To Paca(rana)" indicator shows red that the "From Paca(rana)" will show yellow (unless there is a OSX network issue).
- "Dark Green" - The connection is healthy but there is no current MIDI activity.
- "Light Green" - MIDI is active in the indicated direction. So for example if "From Paca(rana)" is light green that means the Paca(rana) is sending MIDI to the devices and any software using **PacaConnect**. Likewise if "To Paca(rana)" is light green one or more of the devices, or the software, is sending to the Paca(rana).

The device status "LEDs" and MIDI-over-OSC ones can be useful to get a quick indication of how MIDI is flowing in your setup. For example if you play a note on your external keyboard you will see the corresponding "MIDI In" indicator glow bright green. At the same time the "To Paca(rana)" indicator glows bright green.



Press this button to see a more detailed report of why PacaConnect is unable to successfully start

PacaConnect is experiencing problems!
1. Port2's MIDI input is unavailable. Make sure the MIDI interface is properly installed, connected, and powered.
2. Port2's MIDI output is unavailable. Make sure the MIDI interface is properly installed, connected, and powered.
OK

The **PacaConnect** preference pane has one more feature you will find useful should you ever have trouble (indicated by the dreaded red or yellow indicators!) Pressing the *help* button (the question mark button) brings up a screen of information that interprets what may be going on with your **PacaConnect** set up. This button is not available while **PacaConnect** is stopped.

Run PacaConnect

As your last step of the Setup process, press the *Run* button to start **PacaConnect**. *You must manually run **PacaConnect** the first time, or you will need to enable "Run at Login" and then log out and back in.*

The three segment progress indicator above the Run and Stop buttons indicates the status of the Run process. In general,

- all segments green: **PacaConnect** appears to be running properly
- two segments yellow: the program is in the process of starting up or shutting down
- one segment red: a serious condition in which the process has become “stuck” and the program is unable to shut down (logout, force quit, or restart should this occur)

At this point of your first installation and setup, the indicator segments should be grey/darkened since **PacaConnect** has never been started.

After pressing the *Run* button, the indicator should turn yellow then green. While **PacaConnect** is starting, the control panel panel indicators may momentarily display red or yellow. *This is normal.* If, however, the red or yellow remains, then **PacaConnect** has detected a problem with the current setup. Check the colors of the device status and Midi over OSC indicators for diagnostic information or press the *help* (question mark) button.

Using PacaConnect

PacaConnect is designed to work automatically in the background once you have everything properly set. It will load each time you log into your OSX account and sit quietly in the background waiting until you need to send MIDI between your devices, software, and the Paca(rana). When **PacaConnect** sits idle it consumes very little computer resources and can generally be ignored. However if you are the type of user that prefers to only have software running when you are actually using it then you can manually start and stop **PacaConnect** from its preference pane. You can also make future changes to **PacaConnect**'s operation by simply using System Preferences to view PacaConnect's preference pane and make your desired changes.

PacaConnect provides a single OSX virtual MIDI port named "Paca(rana)" that you use as a MIDI connection between your software applications and your Paca(rana). So, for example, you can select "Paca(rana)" as either an input or output to a sequencer track.

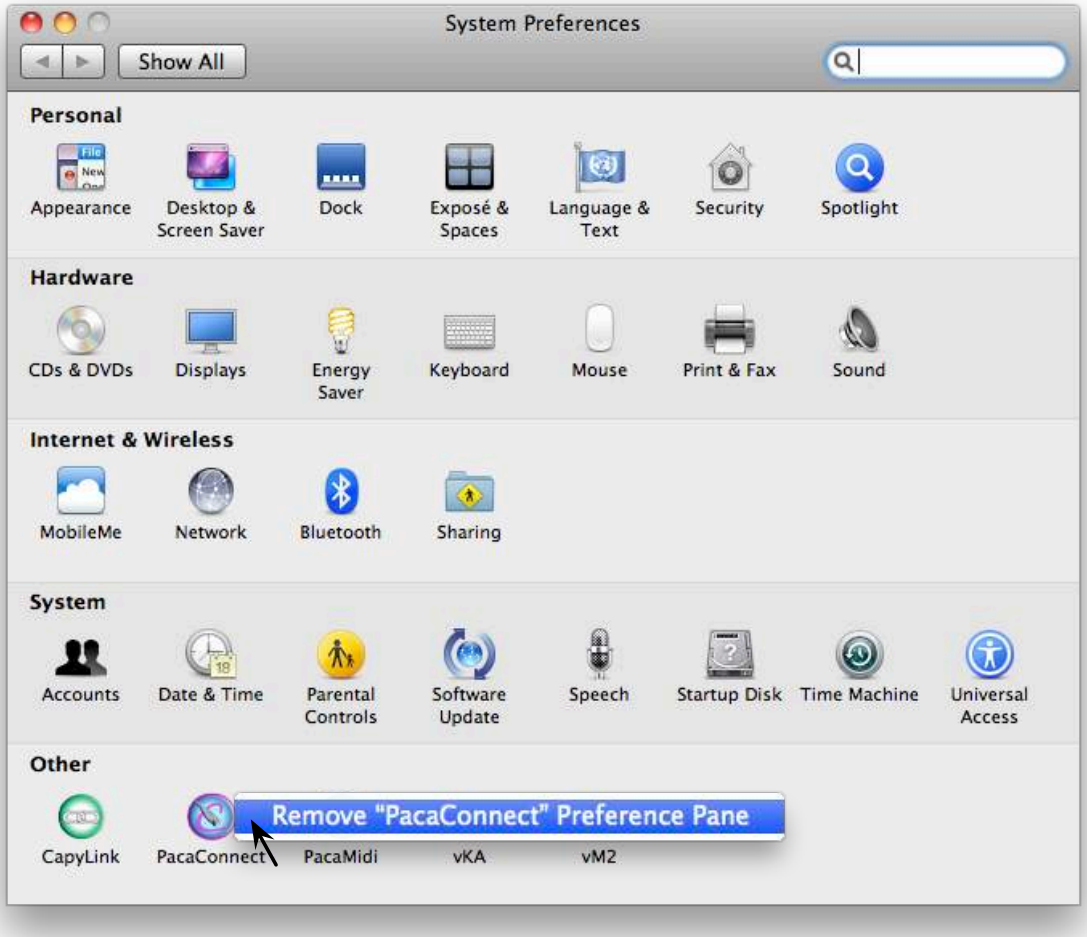
Since **PacaConnect** is built on OSX's CoreMidi framework it is also fully "multiclient". What this means is that two or more applications can be sending and receiving from Kyma at the same time. This is how all CoreMidi devices work.

The "PacaProxy" feature is also "multiclient". Multiple Paca(rana) OSC clients can be connected simultaneously. This means, for example, that you could have **vKiP** running on your iPad and controlling Kyma's VCS, and have **vKi** running on your iPhone (or iPod Touch) providing true one-handed Kyma control.

Removing PacaConnect

If you need to remove **PacaConnect** from your Mac for any reason:

- First, go to the PacaConnect preference pane and press *STOP* to stop **PacaConnect** from running.
- Next, close the PacaConnect preference pane, then right click on the PacaConnect icon (see diagram below). Select Remove “PacaConnect” Preference Pane. This will remove the PacaConnect preference pane and the user agent program from your system.



- Once this is removed **PacaConnect** will no longer run on your system. Run the installer should you decide to use it at a later time.

If you would like to completely remove all traces of **PacaConnect**, delete these files:

<YOUR HOME FOLDER>/Library/LaunchAgents/com.delora.PacaConnect.agent.plist"

<YOUR HOME FOLDER>/Library/Preferences/com.delora.PacaConnect.agent.plist"

/Applications/PacaConnect (remove entire folder)

/Library/Documentation/PacaConnect (remove entire folder)

Note that you must have administrative rights to perform the final two deletions.

Troubleshooting

PacaConnect is usually very transparent in daily use once it is properly configured. Most of the initial connection issues are straight forward to diagnose with the help of the status indicators and the *help* button.

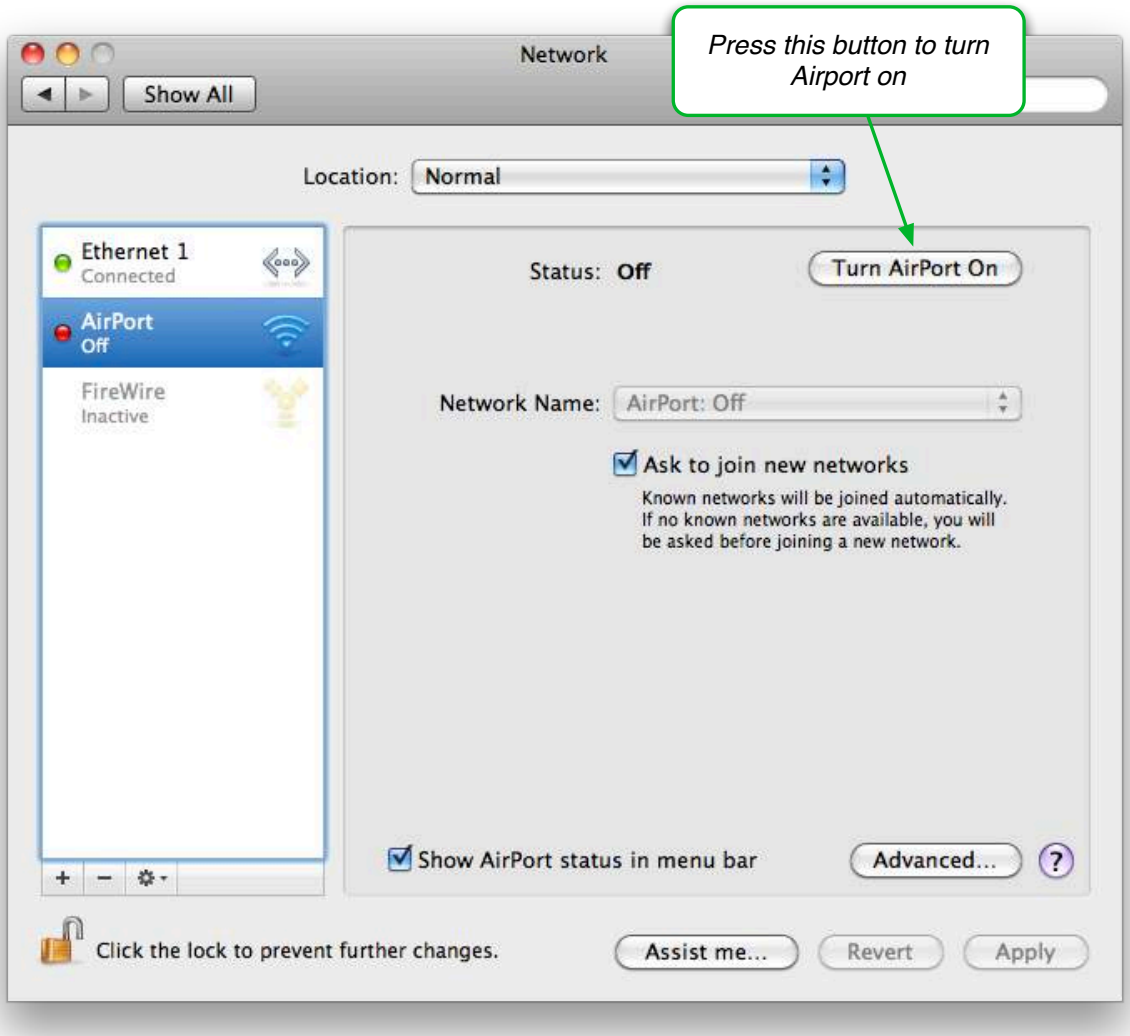
Problems though can arise occasionally even with a set up that was working "just a minute ago". If you suspect a problem then visit the PacaConnect preference pane and see what the indicators are showing. It is very rare that status would be "green" while **PacaConnect** is otherwise confused or has failed. If the status is green then you should suspect some other problem, either with your application software (they are known for problems too!), external hardware MIDI device, or Kyma and/or the Paca(rana). MIDI and network problems are the most likely cause.

There is a rare situation where the **PacaConnect** application can still be found loaded in memory and is running (more or less) but is not responding. The status indicator will show clear, leading you to conclude it is not running. However any attempt to start **PacaConnect** will fail. Often the preference pane will show the "To Paca(rana)" indicator as red when this happens. The most likely cause is that a prior run of **PacaConnect** is still lingering in memory. This is what computer experts refer to as a "zombie process". Unfortunately, like the zombies found in video games and horror movies, a zombie process can be quite difficult to “kill”.

The easiest way to clear this condition is to log out of OSX and log back in. However if you are comfortable working “under the hood” then you can use OSX's Activity Monitor application to display active processes. Search for "PacaConnectAgent". Quit that process and you should be able to restart **PacaConnect** from the preference pane. If you are a real OSX guru you can do something similar from the Terminal application. If neither of these approaches work then you will need to log out and restart your Mac.

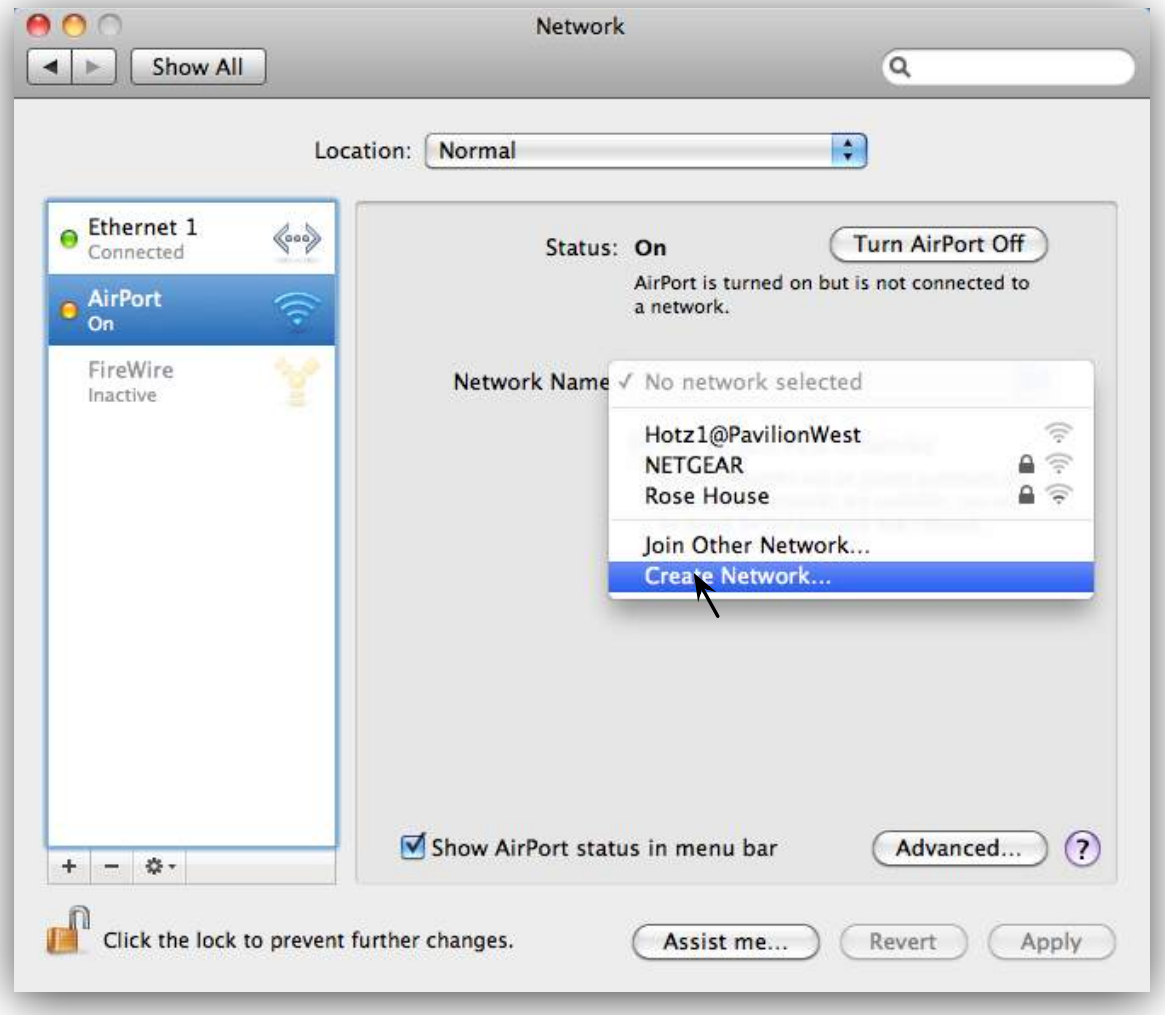
Appendix A: Setting Up An Ad-Hoc WiFi Network

OSX provides a simple, straight-forward way of setting up an ad-hoc WiFi network using a Mac's built-in Airport. The following steps show screen shots from a Mac running Snow Leopard but the process for Leopard is quite similar.



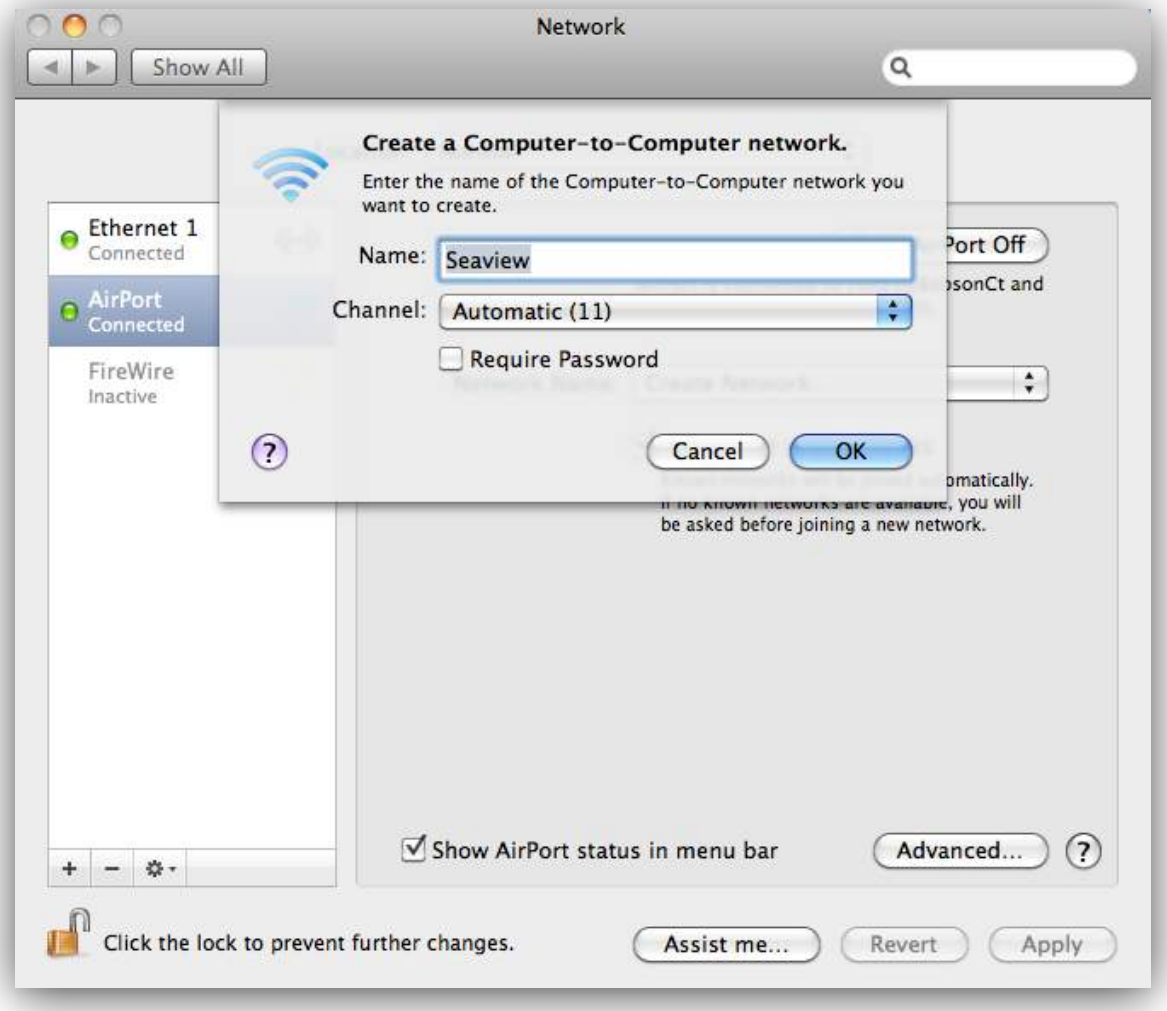
Step 1:

Open *System Preferences* and select "Network". Choose the Airport item from the list at the left.



Step 2:

Open the “Network Name” popup, then select “Create Network...”.



Step 3:

Enter a name for your ad-hoc network. Leave “Channel” set to “Automatic” unless you have problems with interference from other nearby WiFi networks. If you are concerned about another laptop or device connecting to your Mac check “Require Password” and follow the on screen directions. Note that if you elect to employ a password you will be required to enter that password also in your iPhone, iPod touch, or iPad when you attempt to connect to this ad-hoc network.

Step 4:

From your device's *Settings* application select "Wi-Fi". Turn "Wi-Fi" ON if it is OFF. After a few moments you will see the available WiFi network candidates in a list. Select your ad-hoc network, and if you have protected it by password, enter the password. Wait until the network strength indicator at the top left of the screen shows an active connection. This last step is important as it takes a few moments for the device to establish a valid connection with the ad-hoc network. If you leave the *Settings* application before this occurs and try to start another application, that application may be unable to connect. If that happens simply exit the application and wait until you see the signal strength graphic in the upper left.

Acknowledgements

In addition to Harmony Systems, Inc.'s proprietary code, **PacaConnect** contains some code provided by generous and dedicated independent developers. The follow code was used:

AquaticPrime

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oscpack -- Open Sound Control packet manipulation library

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AsyncUdpSocket

This class is in the public domain.

Originally created by Robbie Hanson on Wed Oct 01 2008, updated and maintained by Deusty Designs and the Mac development community

http://code.google.com/p/cocoaasyncsocket/